Refraction Lab

Kit contains:

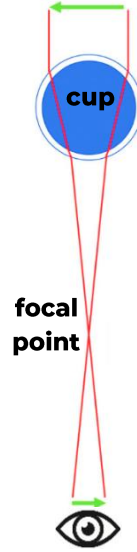
- Cup
- Arrow card
- Dragon card
- Marshmallow card
- Secret message
- Blank card

You will need: a pencil and water.

MORTON GROVE PUBLIC LIBRARY
6140 Lincoln Avenue, Morton Grove, IL 60053
Youth Info Desk: 847-929-5102 | mgpl.org

LIGHT REFRACTION

We need to start our lab with a discussion of **optics**, the study of light. Optics describes how light is created and travel. **Refraction** is the bending of light waves. It happens when light travels between two mediums. In this lab, you will be putting images behind a cup of water. The light travels from the image through the air, through the plastic cup, the water, the plastic cup again and through the air before reaching your eyes.



The light that reaches your eyes coming from the image is **refracted** through your cup of water. With a little bit of trial and error, you can make the image reverse by adjusting the **focal point** where the light from the image crosses.

https://www.science-sparks.com/light-refraction-experiment/

ACTIVITY 1: REVERSE THE ARROW

Fill your cup with water. Place the arrow card behind the cup of water. Look through the water. Move the card closer and farther behind the cup of water, and move yourself closer and farther in front of the cup until the arrow reverses direction.

ACTIVITY 2: TOAST MARSHMALLOWS

Place your dragon next to the water cup. Help him toast the marshmallow dudes. Oh no! They're trying to flee! Refract the marshmallows so they run toward the dragon.

ACTIVITY 3: SECRET MESSAGES

Take out your secret message card. I suspect the writing is reversed. Decipher the message with refraction. Move the card behind the cup of water to see what it says. (This will take trial and error.)

HAVE YOU POOPED TODAY?

Now write your own secret message backwards on the blank card. Then refract it!

ACTIVITY 3: "BREAK" THE PENCIL

Put a pencil in the cup of water. Observe how to section below the water no longer seems to match up with the pencil above the water. This optical illusion is also created by refraction, but the light is traveling through fewer mediums.